

CLAIMS

What is claimed is:

- 1 1. A method for marking data packets from a source comprising the
2 steps of:
3 determining a sending rate estimate, s ; and
4 marking a packet to one of a plurality of priority levels based on
5 the sending rate estimate, s .
*check
ATM
using
"ABR"
approx*
- 1 2. The method of claim 1 wherein the step of marking comprises the
2 steps of:
3 determining if the sending rate estimate is less than a first rate
4 threshold; and
5 in response to a determination that the sending rate estimate is
6 less than the first rate threshold, setting a probability of marking
7 at least one data packet with a first selected priority level to a
8 first value, wherein said first selected priority level is one of a
9 plurality of priority levels.
- 1 3. The method of claim 2 further comprising the step of:
2 in response to a determination that the s is less than the first rate
3 threshold, incrementing a burst size.
- 1 4. The method of claim 1 wherein the step of marking comprises the
2 steps of:
3 determining if the sending rate estimate is between a first rate
4 threshold (FRT) and a second rate threshold; and
5 in response to a determination that the sending rate estimate is
6 between a first rate threshold and a second rate threshold,
7 setting a probability of marking a data packet with a subordinate
8 priority level based on s .
- 1 5. The method of claim 1 wherein the step of marking comprises the
2 steps of:

determining if the sending rate estimate is between a first rate threshold (FRT) and a second rate threshold; and
in response to a determination that the sending rate estimate is between a first rate threshold and a second rate threshold, marking a data packet such that a rate of packets marked a subordinate priority level is no greater than $1 - (FRT/s)$.

6. The method of claim 1 wherein the step of marking comprises the steps of:

determining if the sending rate estimate is above a second rate threshold (SRT); and

in response to a determination that the sending rate estimate is above the SRT, marking the packet such that a rate of packets marked the second priority level is at least $(SRT - FRT)/s$.

7. The method of claim 6 further comprises the step of:

in response to a determination that the sending rate is above the SRT, marking the packet such that a rate of packets marked a lowest priority level is at least $(s-SRT)/s$.

8. The method of claim 1 further comprising the steps of:

determining if the sending rate estimate is greater than a rate threshold;

in response to a determination that the sending rate estimate is greater than the rate threshold, determining if a burst size is greater than a minimum burst; and

in response to a determination that the burst size is greater than a minimum burst, marking the packet a first priority level.

9. The method of claim 8 further comprising the step of:

in response to a determination that the burst size is greater than the minimum burst, decrementing the burst size.

1 10. The method of claim 1 further comprising the steps of:
2 determining if the sending rate estimate is greater than a super
3 rate threshold;
4 in response to a determination that the sending rate estimate is
5 greater than the super rate threshold, determining if a burst size
6 is greater than a minimum burst; and
7 in response to a determination that the burst size is greater than
8 a minimum burst, marking the packet a priority level based on a
9 count of packets marked a highest priority level during a period.

1 11. The method of claim 10 further comprising the step of:
2 in response to a determination that the burst size is greater than
3 the minimum burst, decrementing the burst size.

1 12. An apparatus for marking data packets from a source comprising:
2 a means for determining a sending rate estimate, s ; and
3 a means for marking a packet to one of a plurality of priority
4 levels based on the sending rate estimate, s .

1 13. The apparatus of claim 12 wherein the means for marking
2 comprises:
3 a means for determining if the sending rate estimate is less
4 than a first rate threshold; and
5 a means for setting a probability of marking at least one data
6 packet with a first selected priority level to a first value, said
7 means responsive to a determination that the sending rate
8 estimate is less than the first rate threshold, wherein said first
9 selected priority level is one of a plurality of priority level.

1 14. The apparatus of claim 13 further comprises:
2 a means for incrementing a burst size, in response to a
3 determination that the s is less than the first rate threshold.

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16. The apparatus of claim 12 wherein the means for marking comprises:

17. The apparatus of claim 12 wherein the means for marking comprises:

18. The apparatus of claim 17 further comprises:

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1 19. The apparatus of claim 12 further comprises:

2 a means for determining if the sending rate estimate is greater
3 than a rate threshold;

4 a means for determining if a burst size is greater than a
5 minimum burst, in response to a determination that the sending
6 rate estimate is greater than the rate threshold; and

7 a means for marking the packet a first priority level, in response
8 to a determination that the burst size is greater than a minimum
9 burst.

1 20. The apparatus of claim 19 further comprises:

2 a means for decrementing the burst size, in response to a
3 determination that the burst size is greater than the minimum
4 burst.

1 21. The apparatus of claim 12 further comprises:

2 a means for determining if the sending rate estimate is greater
3 than a super rate threshold;

4 a means for determining if a burst size is greater than a minimum
5 burst, in response to a determination that the sending rate
6 estimate is greater than the super rate threshold; and

a means for marking the packet a priority level based on a count
of packets marked a highest priority level during a period, in
response to a determination that the burst size is greater than a
minimum burst.

1 22. The apparatus of claim 21 further comprising:

2 a means for decrementing the burst size, in response to a
3 determination that the burst size is greater than the minimum
4 burst.

- 1 23. A method to determine probabilities for marking a packet a priority
- 2 level comprising the steps of:
- 3 determining a first probability;
- 4 determining at least one second probability; and
- 5 weighting each probability so that each probability contributes to
- 6 a net probability.

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